Treatment of the Nephrotic Syndrome

EDWARD C. PERSIKE, M.D., *San Francisco*

• *The nephrotic syndrome may be due to varied cause. It may end fatally or in complete healing. No specific cure exists as yet, and basic treatment is dietary. The degree of edema does not necessarily hold a direct relationship to the status of the kidneys or to the eventual outcome.*

THE NEPHROTIC SYNDROME is a disease state characterized by edema, hypoproteinemia, lipemia, proteinuria, and perhaps evidences of a degenerative renal lesion in the urinary sediment. Its etiologic delineation is varied, and often cannot be determined. The syndrome may take place as a consequence of glomerular nephritis when this disease enters the degenerative stage, and it has been seen in association with amyloidosis. It is thought to occur sometimes as a "hypersensitivity reaction" to a variety of stimuli, the terms lipoid nephrosis, pure proteinuria and prerenal proteinuria having been used to describe this condition, which occasionally may be cyclic.[1,2,3,7,9] Rytand[12] described patients in whom the nephrotic syndrome was associated with poison oak dermatitis. The author has observed patients in whom it seemed to be induced by the administration of gamma globulin to ameliorate rubeola, by multiple insect bites, by therapy with penicillin and by the use of sulfonamides.

While the nephrotic syndrome occurs most frequently in childhood, it may occur at any age. In some cases the disease may terminate fatally, but in a substantial number it may disappear and eventually heal completely. This difference in outcome is unexplained, but it does not appear to depend entirely upon the cause of the disease.

No specific cure for the nephrotic syndrome exists as yet. For reasons given in detail elsewhere[2,4,5,8,10] the author believes that necessary treatment consists of maintenance of a large fluid intake and the use of a calorically sufficient diet containing a minimum but adequate amount of protein. For adults, this minimum adequate amount of protein has been shown by the careful studies of Sherman and his associates[13] and by Hegsted and co-workers[6] to be no more than 0.5 gm. of protein per kilogram of body weight. To this amount of dietary protein should be added an increment equal to that excreted in the urine. So far as the author knows, the actual minimum adequate amounts of protein necessary for children have not been established; the usual estimates of 1.5 to 2.5 gm. of protein per kilogram of body weight may well be excessive. In the Clinic for Renal Disease of the Stanford University Outpatient Department, for some years children with renal disease have been treated with calorically adequate diets containing from 0.75 to 1.0 gm. of protein per kilogram of body weight to which has been added an amount equal to that lost in the urine. No deleterious effects upon their growth or development have been observed. Daily rations of calcium and vitamins are given as dietary supplements.

Variations from day to day in the amount of subcutaneous edema are not necessarily prognostic, for they do not always reflect parallel changes in the status of the kidneys or in the fundamental disease process. Treatment to control the edema consists mainly of sodium restriction. In general, the daily intake of sodium chloride must be reduced to less than 1.0 gm. The use of certain currently available ion exchange resins to diminish the gastrointestinal absorption of sodium has not been helpful for the treatment of children with the nephrotic syndrome in the author's experience.

If fluid accumulation increases despite efforts to control it through dietary sodium restriction, it may be evacuated. It may be withdrawn from the chest and abdominal cavities by paracentesis. Southey tubes are helpful for removal of large subcutaneous accumulations of fluid in the lower extremities. In certain instances, the administration of corticotropin (ACTH), cortisone or salt-poor human albumin solution may be of value. Some patients treated with corticotropin or cortisone may experience remissions for varying periods. Mercurial diuretics should not be used to remove fluid since they are nephrotoxic and since they are not as a rule effective in conditions like the nephrotic syndrome which are associated with heavy proteinuria.

While anemia of some degree often accompanies the nephrotic syndrome, it is usually asymptomatic and requires no treatment other than insuring an adequate dietary intake of iron and vitamins. Attempts to correct it through the use of iron, liver,

From the Department of Medicine, Stanford University School of Medicine, San Francisco.

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B_{12} or other hematinic substances have not been successful. If the patient becomes too weak and fatigued for his general needs and comfort, blood transfusions are helpful. The beneficial effect is transient, however, and once begun they often must be repeated to maintain symptomatic relief.

The use of watermelons and watermelon juice for treatment of the nephrotic syndrome recently has had considerable popularity among certain patients and has been widely publicized. Aside from being a novel and pleasant source of fluid, watermelons are of no proven value in the treatment of this condition.

Patients with the nephrotic syndrome are particularly vulnerable to infection. Peritonitis occurs rather frequently, and it was a principal cause of death before antibiotic agents were available. While it is not intended to suggest that all febrile illnesses in these patients should be treated indiscriminately with antibiotics, such drugs should be used without delay and in as specific a manner as possible when it seems likely that the illness is of bacterial origin. If possible, appropriate cultures to determine the particular organism involved and its antibiotic sensitivities should be obtained *before* treatment is begun. Certain patients appear to be more prone than others to peritonitis, and in some of them one bout follows another with perhaps no more than a few weeks intervening. Small daily prophylactic doses of a broad spectrum antibiotic have been used with success in preventing or in diminishing the frequency of these attacks.

Some patients with pronounced edema and abdominal distention from ascites have repeated episodes of febrile illness associated with abdominal pain and tenderness. Initially the symptoms and signs closely mimic those of acute bacterial peritonitis, but disappear completely in one to two days even without treatment and the ascitic fluid remains sterile. On careful examination a thrombosed vein may be noted in the abdominal wall, with an accompanying streak of erythema contrasting with the pallor of the swollen, edematous abdomen. The tenderness may be more pronounced in the affected area than over the rest of the abdomen, and at times the thrombosed vein may be palpated as a tender cord. These clinical observations have been confirmed by pathological examination. While this condition is transient and requires no treatment, it is so closely similar to acute bacterial peritonitis that antibacterial therapy must be instituted without delay and continued until fever disappears and the situation is clarified.

A hopeful attitude should be maintained, particularly with children.[11] Parents should be warned against showing anxiety, for psychologic problems in these children often stem from this cause. For the same reason, the dietary principles outlined previously should be incorporated easily into the family mealtime routine. Children with the nephrotic syndrome should be treated as normally as is possible. They should attend school, they should play with other children, and they should be taught to consider the edema as a temporary hindrance which can be controlled and tolerated rather than as a symbol of sickness and disease.

2408 Clay Street.

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